The Electoral Killing Cycle

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Abstract

Existing literature on electoral violence has focused on how violence shapes voting behavior, suppressing or increasing voter participation. Yet, other forms of violence that are common have received less attention, such as targeted assassinations. By killing political opponents, candidates and politicians influence electoral results, state-capture and consequently the quality of democratic regimes. In this paper, we introduce targeted assassinations as a type of electoral violence and use data of prominent homicides in Brazil from 1997 through 2013 to asses our hypotheses. We explore the presence of strategic, continuous occurrence of political killings in Brazil analyzing which factors turn Brazilian electoral cycles more violent. We advance three major predictions in this paper. First, targeted assassinations are more common in local elections than state-level and national elections. Second, they are more likely to occur around elections in municipalities where poverty and local revenues are high. Third, better law enforcement institutions make electoral cycles less violent. We discuss a set of Cox survival models and we document descriptive analysis consistent with our predictions.

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1 Introduction

Democratic elections are a peaceful, more efficient, and less costly way to define who takes what, when and how. As follows, classic political theories reasonably argue that political violence shrinks as a consequence of stable and competitive democratic elections (Powell, 1994; Dahl, 1971). However, the theory connecting democratic regimes and the end of violence has proved to be inaccurate. As suggested by Dunning (2011), the use of violence and elections can work as strategic complements, where state actors use violence in part to advance electoral aims. Several forms of violence fall under the broad category of electoral violence, with different targets at various stages of the electoral cycle. In this paper, we focus on an underexplored type of violence, target assassinations, and how they can be affected by electoral cycles.

In recent years, the scholarship on political violence has expanded significantly as scholars have engaged in methodologically sophisticated research to disentangle different forms of violence. However, most of what we know about electoral violence has been based on the use of coercive strategies against voters. For example, scholars argue that violence and intimidation may be employed to influence both turnout and vote choice (Chaturvedi, 2005), to increase turnout of supporters and decrease that of challengers (Wilkinson, 2004), to sway swing voters (Collier and Vicente, 2014), and to hold in power when incumbents fear losing it due to institutionalized constraints (Hafner-Burton et al., 2014). Nevertheless, a distinction among voter-, state actor-, and non-state actor-targeted violence can help our understanding of how competitive elections can influence patterns of electoral violence more generally.

To say that electoral violence is affected by elections is tautological. Elections are a necessary but not sufficient condition for violence. Indeed, the political violence cycle peaks at the time of elections (Harish and Little, 2017). Empirical studies show that political violence tends to increase around elections (Aksoy, 2014; Hafner-Burton et al., 2014; Newman, 2013). Nevertheless, it is not the election per se. Findings based on cross-country studies of African countries suggest that determinants of electoral violence are most based on institutional arguments. Violence is higher when a state

has majoritarian elections, a large excluded ethnic group, and high levels of inequality (Fjelde and Hooglund, 2014); when there are international observers, violence is displaced from the election day to campaign periods (Daxecker, 2012); and incumbents are more likely to use violence (Hafner-Burton et al., 2014). Aksoy (2014) also shows that electoral violence is more likely in places with low electoral permissiveness. Arriola and Johnson (2012) argues that electoral violence is less likely to occur where patronage politics continues to facilitate the exchange of political loyalties. Yet, we still know little about what determines the extent and magnitude of different forms of violence in democracies.

We contribute to this scholarship by expanding our current knowledge in two principal directions, one theoretical and another methodological. First, we take the criticism that electoral violence encompasses many different forms of violence and to better understand electoral violence we should focus on different kinds of violence using more fine-grained data (Staniland, 2014; Harish and Toha, 2017). To accomplish this, we focus on politically related homicides in Brazil, in other words, targeted assassinations of politicians, political candidates, human right activists, social activists, and individuals directly related to them, such as family members, political advisers, or campaign staff.

Additionally, instead of focusing solely on violence that happens during elections, we take the proximity of the elections as a source of variation. Although violence peaks at the time of elections, this does not mean that elections are the cause of violent politics (Harish and Toha, 2017). Our methodological contribution is to measure the extent and magnitude of the political cycle of violence. We employ a set of survival model considering the distance between the assassination and the election in months as the dependent variable to assess which factors amplify the effects of elections in the use of violence.

This article offers three main predictions about the electoral killing cycle: (1) assassinations are more pronounced during local elections than during state level, and national elections; (2) public and prominent figures are more likely to be killed in poor

municipalities and where the local government is economically more relevant; (3) better law enforcement institutions decrease the chances of political assassinations. We find that targeted assassinations are more sensitive to the proximity of local elections than national elections. Holding local office brings economic and political benefits, since most of the economy of small municipalities are dependent on the public sector. The killings occur when the person assassinated is an obstacle to the killer's political and economic goals. Besides, local executives are more influential in small and poor municipalities, where law enforcement institutions are weaker and more prone to state capture.

2 Targeted Assassinations

The study of electoral violence lumps together different kinds of electoral violence, ignoring important variation in the forms and the actors involved in electoral violence. Staniland (2014) offers a typology that identifies seven types of electoral violence, in which the actors who employ violence can be state actors, non-state actors linked to the regime, opposition groups, and unaligned actors. Furthermore, he distinguishes two types of goals, intra-systemic and anti-systemic goals. Intra-systemic goals are the ones within the existing institutional system, actors do not aim to change the current system. Anti-systemic goals are related to actions that aim at overturning the current system. However, much of the empirical findings on electoral violence have relied on the typologies developed by scholars, using cross-country datasets (Birch and Muchlinski, 2017) or country-specific cases, such as Kenya in 2007 (Kagwanja, 2009; Dercon and Gutiérrez-Romero, 2012; Bratton, 2008; Collier and Vicente, 2012)

Most of these studies focus on government-sponsored violence – events in which incumbents or ruling parties intimidate potential voters and political opposition during of after elections (Hafner-Burton et al., 2016). The targets can be specific groups or the mass, and it is not necessarily targeted. Furthermore, it can be both spontaneous or organized acts by incumbents, parties, candidates, party supporters, election authori-

ties, or voters. Alternatively, we focus on a type of electoral violence that has a specific individual target and do not happen spontaneously; they are always deliberate actions perpetrated by or for a politician to advance their electoral goals.

Targeted assassinations are a common feature of history and the systematic use of violence to eliminate opponents or intimidate candidates is a long-lasting strategy. However, there are only a few studies in social sciences dealing directly with political assassinations as a form of electoral violence, although the phenomenon is widespread many countries. The assassination of a head of state has consequences for political stability (Iqbal and Zorn, 2008) and political institutions (Jones and Olken, 2009). In 1961, the assassination of the first president of the Republic of Congo, Patrice Lumumba, was arranged by his contender Mobutu. Another emblematic case happened in April of 1948 in Colombia, when popular candidate Jorge Eliecer Gaitan was assassinated leading to the period of "La Violencia" between conservatives and liberals in the country. Forty years later, another presidential candidate was murdered in Colombia, Luis Carlos Galan.

Targeted assassinations are not just limited to presidential campaigns and national leaders. According to a report published by Colombia's Mision de Observacion Electoral (MOE), a civilian election observer group that collects data on threats, kidnappings, assassinations and attacks against politicians and public employees, has registered, only in 2017, 273 cases of violence against political and social leaders. In Mexico, the scenario is not very different. Since September 8th, 2017, when the electoral cycle officially started, 173 physical threats against politicians were documented, being 78 assassinations of politicians[1]. Criminal groups can also use violence to influence elections and politics. For instance, high-profile assassinations are used by drug cartels in Mexico to take over local government (Trejo and Ley). Similarly, the Italian Mafia embarked on targeted killings and violence against politicians as a reaction of electoral success of rival groups, to change electoral outcomes, or to intimidate politicians and political activists (Alesina et al., 2016).

[1]See article.

Our study, therefore, contributes by bridging two bodies of literature: it underscores that targeted assassinations can be a common form of electoral violence perpetrated by state actors. The main difficulty of studying targeted assassinations most of the times is data availability and identification. By using fine-grained data from Brazil, we can identify the location and timing of targeted homicides. Moreover, we do not establish the factors that cause targeted assassinations, but we provide an association of elections and different factors that can increase the likelihood of targeted killings.

We also contribute theoretically and methodologically to the election violence literature. Whereas most studies focus on voter-targeted violence, we add a new component to the typologies of electoral violence. Our results corroborate Aksoy (2014), Hafner-Burton et al. (2014), and Newman (2013) showing that political violence tends to increase around elections. However, we show which factors can exacerbate targeted assassinations that can change the political game. Therefore, the present study advances this agenda by theoretically and empirically linking assassinations to electoral violence.

3 Hypotheses

The logic of using violence towards politicians and social activists around elections suggests three key predictions tested in the present study:

Local elections: *Targeted assassinations are more common in local elections than state-level and national elections.*

The idea that elections are a peaceful way to dispute political power has proven inaccurate. Holding regular elections are central to democracies, but also increase the use of violence around elections by elites (**?**Harish and Toha, 2017; **?**). Building on this logic, we argue that it is not election per se, but the *type of election* that influence violence. We predict that local elections for mayors and local councilors present higher levels of targeted assassinations than national polls, where the candidates are running for federal and state legislative and executive. Although higher office means more re-

sources, the stakes are also high. It increases the costs of assassinations by increasing the probability that the crime will be investigated. In addition, holding local offices bring economic and political benefits, since most of the economy of small municipalities in Brazil are dependent on the public sector.

Income and Revenue: *Targeted assassination are more likely in poor municipalities than in wealthy municipalities as elections approach.*

The costs of engaging in political assassinations in low and middle-income municipalities are more moderate for two reasons. First, lower income districts tend to have weaker states and higher propensity toward conflict (Besley and Persson, 2010). Weaker states can also affect the quality of law enforcement institutions, reducing the chances of someone to get caught and punished. Therefore, levels of crime and violence increase. Besides, income tends to be negatively associated with corruption (Acemoglu et al., 2002; Svensson, 2005) and positively to accountability (Ferraz and Finan, 2011). In low-income settings, voters are usually less educated and hold politicians less accountable, which might allow politicians to engage more in criminal activities, including misappropriation of public funds. In other words, lower levels of income directly affect the costs for political actors to engage in violent strategies to achieve their goals.

Second, income indirectly affects political assassination by changing the price of committing a violent crime. A mechanism linking income to more violence is the opportunity cost of taking up arms (Collier and Hoeffler, 2004; Dube and Vargas, 2013). This intuition was first presented by Becker (Becker, 1968) where the likelihood of committing a crime is approached as an optimization problem. When the payoff of the illegal activity surpasses the payoff of legal activities (such as a regular salary), people are more likely to commit offenses, taking into consideration the probability of detection and the size of the punishment. Hence, following Collier and Hoeffler (2004) and Dube and Vargas (2013)'s argument that income affects people's propensity to take up arms, more people are willing to commit the assassination and the propensity toward violence increase.

Furthermore, the benefits of committing assassinations are higher in low-income places than in high-income places. This is because, although poor environments have lower levels of total revenue, they are more prone to corruption (Svensson, 2005). Consequently, in places with more corruption, politicians can extract more rents while in office. Fisman and Golden (2017), for example, find that local elites often capture disproportionate amounts of resources through theft or deliberately politicized redirection of government funds. Thus, in districts with lower levels of income, elites can benefit from rent extraction and the use of public office for personal gains.

The first two predictions relate directly to the benefits of killing. The opposite occurs where the costs are high, i.e. when chances of getting caught and punished are higher. For instance, municipalities with their own municipal police force crowd out the use of violence during the electoral cycle; and municipalities where general levels of violence are high, the electoral cycles tend to be also more violent.

Institutions: *Law enforcement institutions increase the likelihood of targeted assassinations to happen with the proximity of the elections.*

Crimes and homicides are directly affected by legal capacity by both increasing the probability of prosecuting and enforcing punishment. Probability of detection, size of punishment, likelihood of conviction, and probability of winning elections are factors that affect costs and benefits costs of committing an assassination. First, the level of legal capacity increases deterrent. When institutional capacity is strong, probabilities of detection and conviction are higher, which increases the costs of using illicit electoral strategies. It follows that politicians would be less likely to commit assassinations overall. Besides, compared to other illicit strategies, they are less likely to choose assassination over vote buying, for example, since violent crimes are subjected to stronger sanctions. Drago et al. (2009) test the theory of deterrence and find that an additional month in expected sentence reduces the propensity of recommitting a crime. Nichter (2011), for instance, shows that despite its criminalization in Brazil, vote buying continues to be practiced by many politicians, indicating that or the law is not being enforced or politicians can escape free of legal charges.

Furthermore, in many settings, politicians in office are less likely to be convicted. They can file appeals to finish their mandates or use "privileged forum," as in Brazil and Colombia, a special legal protection from prosecution in the common courts (Rolim, 2005). While the special treatment given to politicians reduces costs of engaging in illicit activities, it also increases the benefits of holding political power (Calixto, 2014; Fisman and Golden, 2017). Under weak law enforcement institutions, politicians are more likely to infiltrate and use the institutional capacity to uncover their crimes.

We proxy state capacity as law enforcement through municipal police, judicial posts, and general homicide rate. The first two are direct measures of state capacity while the third indicates a lack of investigation of homicides and persistence of violence. We follow Sikkink (2011)'s argument that high levels of present human rights violations are associated with a lack of accountability for past abuses. We expect that the in the absence of these institutions and high levels of violence, the costs of engaging in violence against political opponents should decrease and assassinations are more likely to occur.

4 Electoral Violence in Brazil

4.1 Institutional Background

Brazil is administratively divided into 27 states, further subdivided into 5,570 municipalities in 2018. States have competencies concerning policing and criminal justice, and sharing responsibilities with the federal government on health, education, and infrastructure. Accordingly, municipal governments share these obligations with state and federal governments; however, having active roles in delivering public services related to education, health, transportation, and infrastructure. Regarding educational policy, municipal governments have control over early childhood education policy, including elementary school, while state and federal government are in charge of high school and higher education, respectively. Municipal governments also provide many basic civil functions, from collecting municipal taxes to providing local order.

Municipal elections in Brazil take place every four years, two years after the elections for president, governors, and members of Congress. The political structure at the local level mirrors the presidential arrangement of the central government, except that states and municipalities have a unicameral legislature. Mayors in most municipalities are elected by a plurality system[2] and local councilors by open list proportional representation.

Studies about local power in Brazil historically view local politics as an arena mostly dominated by the use of non-democratic, violent tools (Leal, 1975). Nevertheless, the country's democratization and the enhanced political and administrative power at the local level attributed by the new constitution in 1988 brought some new perspectives to the field. In the last three decades, studies of local politics have focused more on institutions than the historical approach based on the dysfunctional failure context of local politics. Examples of the recent research agenda on local politics in Brazil investigate the role of participatory innovations and civil society (Touchton and Wampler, 2014; Avritzer, 2009; Abers, 2000), the presence of incumbency effects on local elections (Klašnja and Titiunik, 2017; Brambor and Ceneviva, 2012), the importance of local politics to national legislative politics (Avelino et al., 2013), and the emergence of mass partisanship and party institutions in the local level (Samuels and Zucco, 2014; Van Dyck, 2014). Furthermore, more critical for the new wave of the scholarship, there is also an emergent discussion of the deterioration of clientelistic politics in Brazil (Zucco, 2008, 2013; Hidalgo, 2010; Sugiyama and Hunter, 2013), although the use of clientelistic practices is still frequent in many parts of Brazil(Hidalgo and Nichter, 2016).

As the scholarship on local politics in Brazil evolved in the last decade towards these new issues, the research on elite dominance through non-democratic tools was mostly neglected. However, the expectations connecting the adoption of local democratic institutions, stable and competitive elections with the vanishing of violence from the political arena was not fulfilled in Brazil, as in many developing democratic countries. The country moved to a democratic regime where violence is still a common

[2]In municipalities with more than 200,000 voters, if none of the candidates reach an absolute majority, there is a runoff between the top two candidates.

political tool. It is imperative for the field on political institutions in Brazil, and in developing countries more broadly, to further understand why, when, and how violence could still survive as a viable option to solve political and social conflicts.

4.2 Data

We combine two datasets that identify targeted assassinations. One comes from the *Comissão Pastoral da Terra (CPT)*, a Brazilian NGO with ties to the National Conference of Bishops of Brazil. This organization collects information about the assassinations of social activists, human rights defenders, environmentalists, and activists in general. Our study is not the first one to work using data from CPT, Brambor and Ceneviva (2012) and Hidalgo (2010) use the data collected by this organization to analyze social conflicts in Brazil[3].

The second dataset was built by a journalist from *Estadao*, one of the main newspapers in the country. He was in charge of a special journalistic report about political homicides in Brazil between 1997 and 2013. He collected cases of assassinations committed against a politician or a political candidate motived by a (i) ongoing dispute for *political power*, (ii) *revenge*, (iii) *elimination of evidence*. In *political disputes*, the homicide is committed or ordered by someone who wishes to prevent the assassinated from expanding power and influence. Moreover, it can also happen to prevent someone from influencing the political agenda or when they are a threat to political interests. It also covers cases in which a politician or someone closely associated with them, was killed to *revenge* the murder of a politician in the dispute for power or to cover the authorship of a crime. Also, cases in which someone, not a politician, is killed because they know about an assassination, even if this person does not hold a position in government were included. Other cases involve the *elimination of evidence*. For example, these could include anyone who has witnessed the assassination and can incriminate the

[3]The CPT is one of the most important social organization in Brazil, with a long and robust history of struggle in defense of human rights in the country. Therefore, we have no question about the reliability of the data. However, the organization has its agenda mostly focused on land disputes and rural conflicts. The next step of this working project is to expand our collection of cases to include social violence more related to urban violence.

Table 1: Descriptive statistics of the number of political homicides

	Average number of political homicides	Standard deviation	Maximum	Minimum	Total	Number of Years
Local electoral year	94.75	25.42	124	72	379	4
National electoral year	76.00	17.93	99	59	304	4
Non electoral years	77.88	18.18	109	56	623	8
Total	81.62	20.24	124	56	1306	16

person who ordered the murder. In our understanding, these two datasets combined are the most comprehensive collection of cases on targeted assassinations in Brazil. By disaggregating these data from homicides in general, we can better understand what the mechanisms driving violence in democratic regimes are.

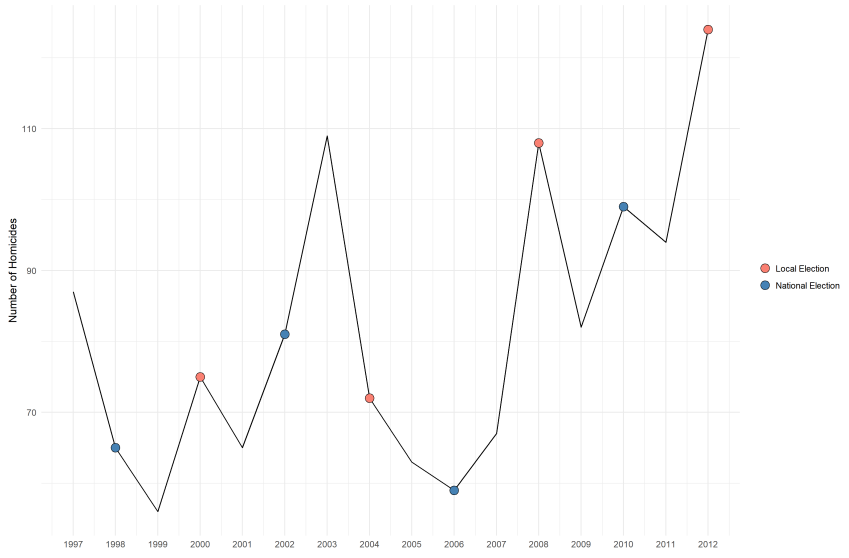
Table 1 presents an overall description of the cases of targeted assassinations across the eight electoral cycles of our dataset including four local elections (2000, 2004, 2008, 2012) and four national races (1998, 2002, 2006, 2010). From 1997 to 2012, we find 1306 cases of assassinations. Among this total, 788 homicides were committed due to political disputes, while 518 murders were against activists. An average of 81 assassinations happened per year during the period representing almost seven killings with political motivation per month. In the most violent year, in 2003, 109 targeted homicides occurred; in this year, the use of violence resulted in nine politically motivated assassinations per month. In isolation, these numbers are already astonishing; however, they become even more severe when considering the fact the assassinations happened during democratic years and when Brazil consolidated a position of leadership in economic and political aspects in the region and globally.

Table 1 also presents the results according to the electoral cycle. The average of assassinations in local electoral years is 94.75 killings; in the four years with local elections of our sample, eight targeted assassinations happened in each month. The average number of targeted assassinations in the years of national elections is considerably smaller with 76 cases while the years without electoral disputes have a similar average among 77.8 cases per year.

The key puzzle we investigate in this paper asks how and under which conditions

the electoral cycle triggers the use of violence against politically relevant citizens. For this reason, observe the variation of crimes over time provides some valuable insights. Figure 1 plots the occurrence of political assassination from 1997 to 2012 highlighting the years with local and national elections. In our view, Figure 1 goes in hand with our first hypothesis about the increasing levels of violence on local elections. Except for 2003, the graphs clearly show how local elections are responsible for pushing up the general levels of political violence over time. In most of the years with local elections, we observe a spike in the number of targeted assassinations corroborating our initial intuition on the underlying electoral cycle of violence.

Figure 1: Political assassinations over time



Local councilors - 128 cases of assassinations - and mayors - 43 cases - form the most targeted group of politicians. The highest political positions in our data are cases of candidates to the governorship and federal representatives who were assassinated. Among the activists, most of the targets were land rights activists and environmentalist, specifically, rural workers, president of rural unions, and members from traditional communities.

Figure 2 explores some spatial features of the use of violence in Brazil. The map plots all the cases of targeted assassination according to the municipality where the crime happened. The figure gives a clear sense on which areas of the country assassi-

nations are more likely to occur providing us some exploratory description about the use of violence in the country. First, the Northeast region concentrates most of the cases of violence. Research on Brazilian politics points out to this region as the one where clientelistic relations, patronage, vote-buying and the presence of political machines is more prevalent (Zucco, 2008; Ames, 2001; Hidalgo and Nichter, 2016). Thus, the map indicates violence occurs associated with other non-democratic practices in the democratic arena.

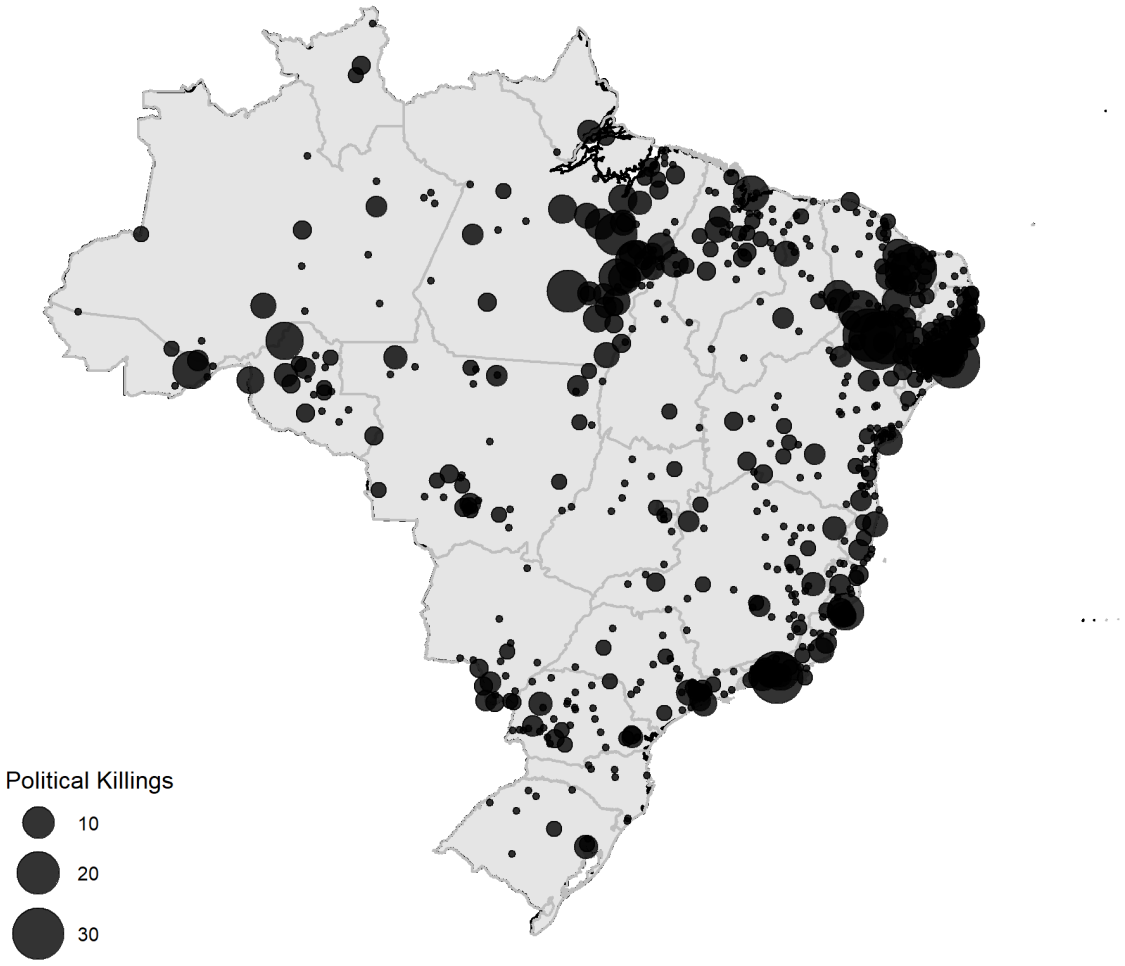
Additionally, the North of the country also concentrates a noticeable amount of cases. The history of this region has been marked by land rights and environmental conflicts, and more recently by the expansion of the new frontier of agricultural production, in particular, soybean producers. The area has witnessed some of the most worldwide known cases of targeted violence against social activists in Brazil, such as the case of the environmentalist Chico Mendes assassinated in 1988, and the American nun Dorothy Stang in 2005, murdered in 2005. Finally, the Southeast cost of the country also sees a large amount of cases which indicate not only poverty and low levels of development explain the use of violence as a political tool.

5 Modeling the Electoral Cycle of Killing in Brazil

In this paper, we analyze targeted assassinations in Brazil and their relations with electoral cycles. As carefully discussed in a previous section, we advance three significant hypotheses about political violence towards targeted political figures. First, local elections are more prone to see the use of politically-driven homicides than national polls. Second, in poor municipalities, where the benefits of holding the office are higher, assassinations are more likely. Third, where the costs of using violence are lower, assassinations are more prone to occur closer to the election period, therefore, as a consequence of the electoral business cycle.

The use of violence in democratic regimes targeting a politically relevant actor can be understood as an event-failure. As the onset of war, the termination of a cabinet,

Figure 2: Mapping targeted assassinations



or the retirement of a judge, political assassinations are an unexpected failure coming from a dynamic process. Our expectation about democratic rules is that conflicts will be solved in a peaceful, agreed and predicted way, but when an agent decides to kill her opponent, we are in front of a failure of a democratic regime. When one considers that this particular failure is occurring under some underlying period, in our case the electoral cycle, we may hypothesize how time affects the chance of the failure to occur. This theoretical intuition shapes the way we decide to model our research question.

Using this approach, we model the following data generating process. Our unit of analysis - *targeted assassinations* - live in a particular time frame - *the electoral cycle* - and survive until some failure - *the homicide*. To model this particular type of problem, two crucial challenges emerge: first, we should deal with time-dependency of the event; second, we have no information about the shape of the survival curve over time (Beck and Diego, 1998; Carter and Signorino, 2010). The use of survival models has been largely implemented in related research dealing with a similar data generating process in which these type of concerns are relevant (**?**Alt and King, 1994; Cazals and Sauquet, 2015; Diermeier and Stevenson, 1999; Binder and Maltzman, 2002). We opt to employ this class of models in this article, and as far as we are aware of, we are the first to employ survival models to analyze political violence on democratic regimes.

Survival models focus on explaining explain how the risk, or hazard, of an event occurring at a given time is affected by covariates of theoretical interest. A critical point on survival models is how to parameterize the hazard rate. Intuitively, the hazard rate is how the risk of failure changes over time. We opt for a Cox proportional model where no distribution is assumed for the baseline hazard rate. We opt for this strategy precisely to reduce any strong functional assumption about the hazard rate. It can be the case that we have a hazard rate which increases linearly over time, or it spikes at some months of the electoral cycle; however, since one of our crucial hypothesis is exactly how the electoral cycle shapes the hazard rate, the use of the nonparametric cox model seems the best approach. The model has a parametric component represented by the covariates added to the model to explain changes in the hazard over time (Box-

Steffensmeier and Jones, 2004). The baseline model is represented as follows:

$$\tau_{(t|X_j)} = \tau_{t_o} \exp(X_j \cdot \beta) \tag{1}$$

Where $\tau_{(t|X_j)}$ represents the hazard rate until time t, τ_{t_o} the baseline hazard modeled nonparametrically, and **X** is a matrix of covariates. The variables, their measurements, and the interpretation of the model are presented below. In the section of robustness checks, we use a different specification of the model employing a hierarchical estimation, commonly called in the literature *frailty models*. In this hierarchical models, we specify the baseline hazard rate as a random intercept across the years, the states and the geographical regions in Brazil. Using this estimation strategy, we deal with unobserved heterogeneity not incorporated on the parametric side of the survival estimation, but present across each of the clustered variables (Box-Steffensmeier and Jones, 2004, Chapter 9) (Therneau et al., 2003; Darmofal, 2009). We discuss this specification more carefully in the corresponding section.

5.1 The Dependent Variable

The hazard rate $\tau_{(t|X_j)}$ represents the risk of a political homicide occurs given that the event has not yet happened until time t. We model the dependent variable as the count of months between the beginning of an electoral business cycle and the month of the homicide. The decision to use months instead of days has two motivations. First, we reduce measurement error related to the precision of the information around the exact day of the assassination. Second, we increase the statistical power of the models reducing the variance of our data [4]

In a practical example, imagine the case of the local electoral cycle of 2012 - the last included in our sample. As explained previously, elections in Brazil occur at the same time for all municipalities and in an interval of four years. Therefore, we start our count in the first month of 2009, where t is equal to zero, representing the starting

[4]We tested the same models using days instead of months prior to the elections and the results hold. We opted to show the results for months due to clarity. The results for days as the dependent variable are available upon request, and will be available soon in an electronic appendix.

point of a new electoral cycle. Additionally, the endpoint of the electoral cycle is the month during which the election occurs, where t is equal to 45, representing in our example October 2012. We employ the same model for all the four local and four national electoral cycles included in our sample.

For an intuitive interpretation of the model, the estimated coefficients represent the log of the instantaneous change in the hazard rate. In our case, they represent the increase/decrease in the hazard rate of a homicide occurring taking into consideration the time of the electoral cycle. Positive/negative coefficients indicate an increase/decrease in the hazard rate. It is important to note that all our cases are fully right censored given the sample is composed only by episodes of homicides; therefore, at the end of the electoral cycle, all the cases have already a failure at some point t. Given the way we set up the dependent variable in which the endpoint of our time frame is precisely the month of the election, positive coefficients mean homicides are happening farther away from the election, for example, in the first months of the electoral cycle. To the contrary, negative coefficients represent a delay in the hazard rate, meaning that the covariates in question press out the homicides to the end of the distribution; more precisely, closer to the occurrence of an election.

We start our analysis comparing specifications using the proximity of the national and state level elections to the timing of the assassination. In this first set up, we focus on discussing the differential impacts of the local electoral cycle to the national electoral cycle. As we show later, the effects of the covariates are mostly null on the hazard rate using the national electoral cycle. Together with other descriptive statistics, the comparison of both models provides robust evidence for our first hypothesis. Moving further in our analysis, we focus on the local electoral cycle as our dependent variable to test the other predictions argued in the paper[5].

[5]We decided to use only local elections to test the second and third hypothesis because having national elections only adds noise to our data given the lack of impact of the proximity of national election.

5.2 The Independent Variables

Our primary set introduces proxies relates to our second hypothesis. We employ two main variables: i) we use the share of the population in each municipality that receives less than one minimum-wage measured in the year of the assassination; ii) we also add the share of the municipal GDP composed by the local executive revenues [6]. Our intuition for both variables are similar: greater the levels of poverty and greater the importance of the executive in the cities' economy, more cost-effective the assassination is. We expect the electoral cycle to matter more in these cases, and the homicides to occur closer to the month of the election. Therefore, coefficients are supposed to be negative also for the variables.

For our third hypothesis, we employ three proxies which approximate local state capacity. We use i) the presence of independent municipal police, ii) the presence of a judicial post in the city, iii) the log of the number of crime-related assassination in each municipality in the year of the political homicide. For the first two, we expect positive coefficients; in cities with both institutions of law enforcement, we expect violence to be less dependent on the electoral cycle. For the latter, we expect negative coefficients: greater the general level of violence in the city, less costly is also to employ violence as a political tool; thus, targeted assassinations occur later and closer to the month of the election.

Furthermore, we add a series of control variables on the model whose omission may confound the results: i) the percentage of the rural population is measured as the percentage of a municipality's population that is rural; ii) The GDP per capita for each municipality measured in thousands; and iii) the aggregated number of political assassinations in our sample for each city. We summarize our expectation for the variables on table 1 2. All the data on socioeconomic features and institutional information of Brazilian municipalities are delivered from official figures made public by the *Instituto Brasileiro de Geografia e Estatística* (IBGE)

[6] We use the average of the revenues from 2008 to 2012 and divide by the municipal GDP at 2012 to build this proxy. We opt for this measurement because of the high number of missing data on revenue for each year.

Table 2: Summary of the independent variables and hypothesis

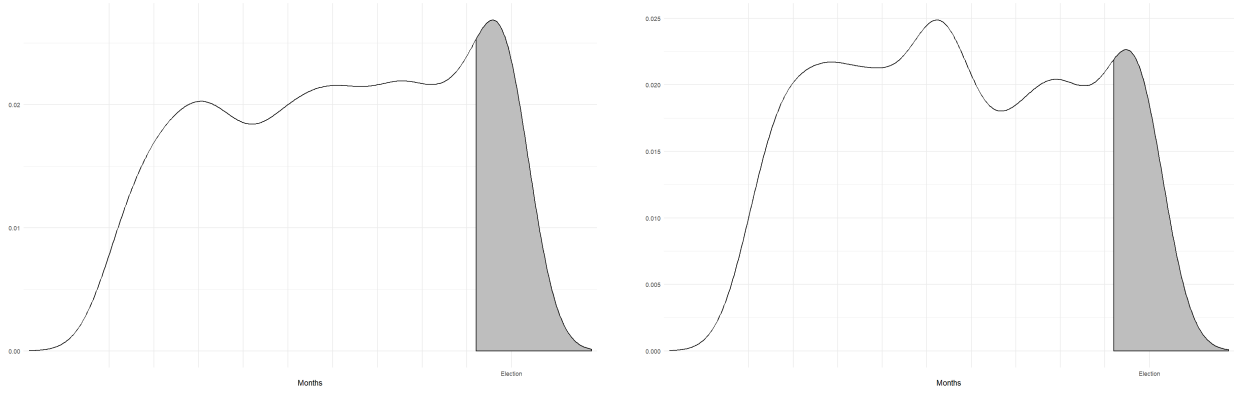
Variables	Direction
Benefits	
Minimum wage (%)	Negative
Revenue Per Capita	Negative
Costs	
Log Violent Crimes	Negative
Municipal Police	Positive
Judicial Post	Positive
Controls	
Gdp Per Capita	Positive
Rural Population (%)	Negative
Total Political Violence	Negative

6 Results

To assess how electoral cycles matter for the use of violence, we start the empirical section plotting the distribution of our dependent variable. Figure 3 shows the density of the distribution of homicides across the local and the national electoral cycle measured by month. The gray area in each graph represents the period where the electoral campaign starts, which is four months before the election day. Figure 3 indicates a higher density of homicides precisely during the electoral period of local elections. We call the attention of the reader to a noticeable spike in the levels of violence when one gets closer and closer to the month of the local elections. Additionally, the tendency is opposite for national electoral cycles; rather than a bimodal distribution, we clearly observe cases skewed toward the proximity of local elections. These graphs already provide some valuable exploratory evidence for our first hypothesis. We move on discussing the results from the survival models.

Figure 4 presents the results for the Cox survival specifications. The graph plots the odds ratios of the model with confidence intervals at 95% of statistical significance. We point the reader to the Appendix A in which we present the tables with the full information about the models. As discussed before, negative coefficients - or odds ratio between zero and one - represent longer time-life span; therefore, meaning that the use of violence occurred closer to the month of the election. Positive coefficients - or odds ratio larger than one - represent shorter time-life span indicating the presence

Figure 3: Density of political violence over the electoral cycles



a) Local Electoral Cycle b) National Electoral Cycle

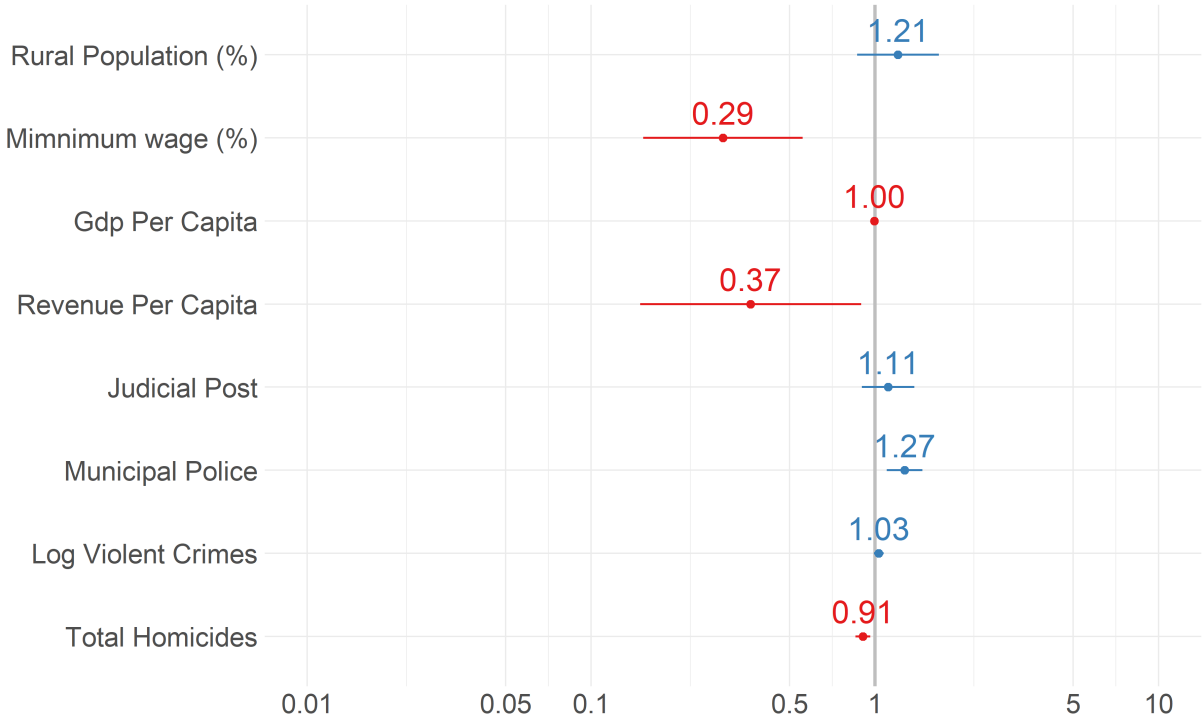
of violence on the first months of the electoral cycle. In an intuitive way, we suggest the reader to think about negative coefficients pulling violence closer to the month of the election, and negative pushing in the opposite direction. The top figure uses the **local electoral cycle** as the dependent variable, while the figure on the bottom uses the **national races**.

The comparison between both models goes in the direction of our first hypothesis. Almost all the variables added to the second model have no impact on movements in the hazard rate, whereas in the case of the local electoral cycle the hazard is highly dependent on the covariates. The impact of covariate summed with the previous exploratory statistics provided before indicates how the use of violence is not dependent on the timing of national elections.

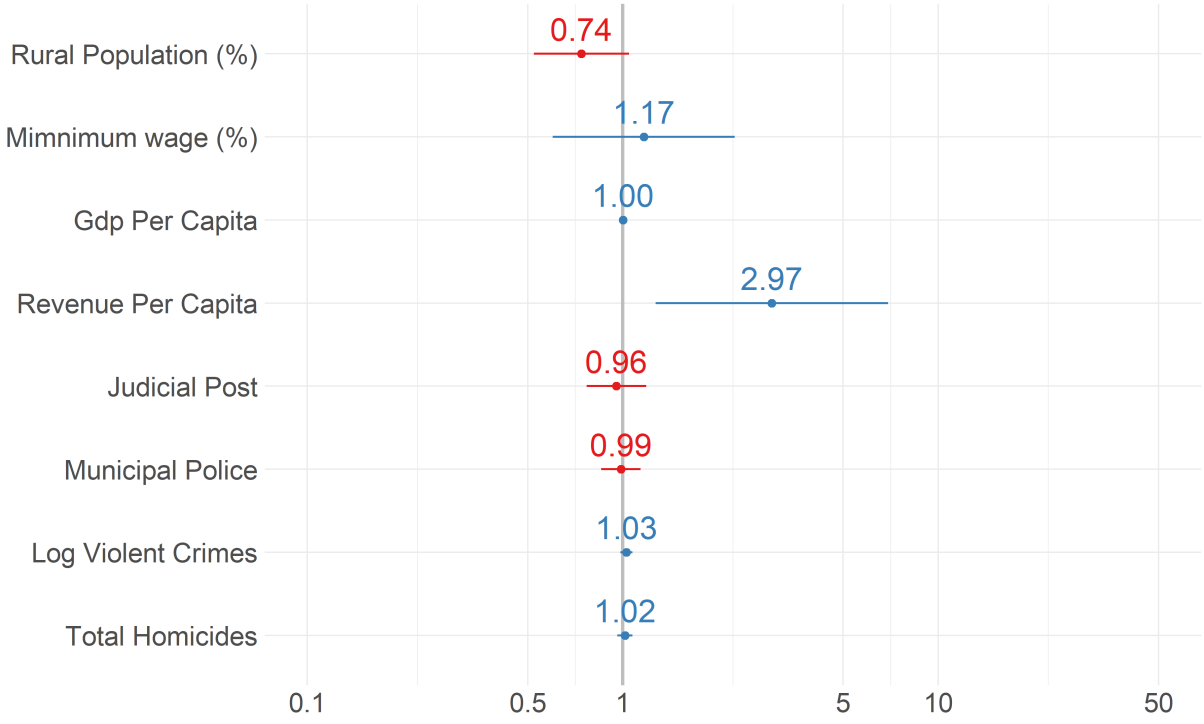
Additionally, we also provide more tests to corroborate our first hypothesis. We compare the baseline hazard rate between both models and their variation across time. Figure 5 presents the results. We show how the cumulative hazard for the national electoral cycle is almost the same over the electoral cycles, with a small increase close to the month of the election. However, for the local election, the cumulative hazard is heavily more dependent on the electoral cycle. More important, Figure 5 show a strong jump on the baseline hazard rate exactly on the month of the local election; therefore, providing more elements confirming our first hypothesis.

Having provided enough information on the risks associated with the local election,

Figure 4: Results Cox Proportional Models

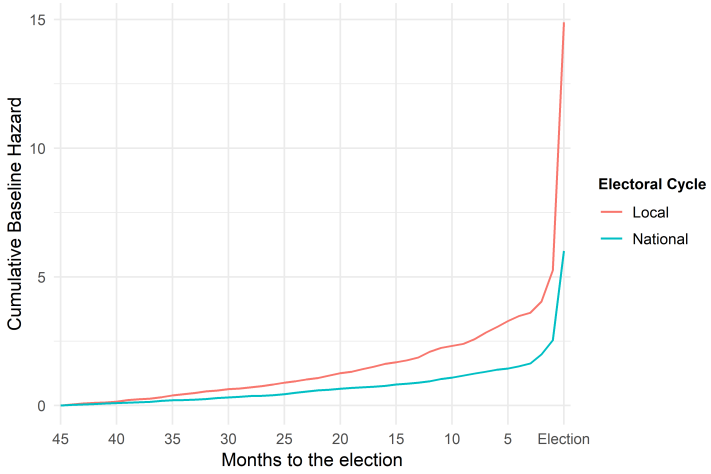


a) Local Electoral Cycle



b) National Electoral Cycle

Figure 5: Cumulative Hazard Rate for Cox Models on Local and National Electoral Cycle



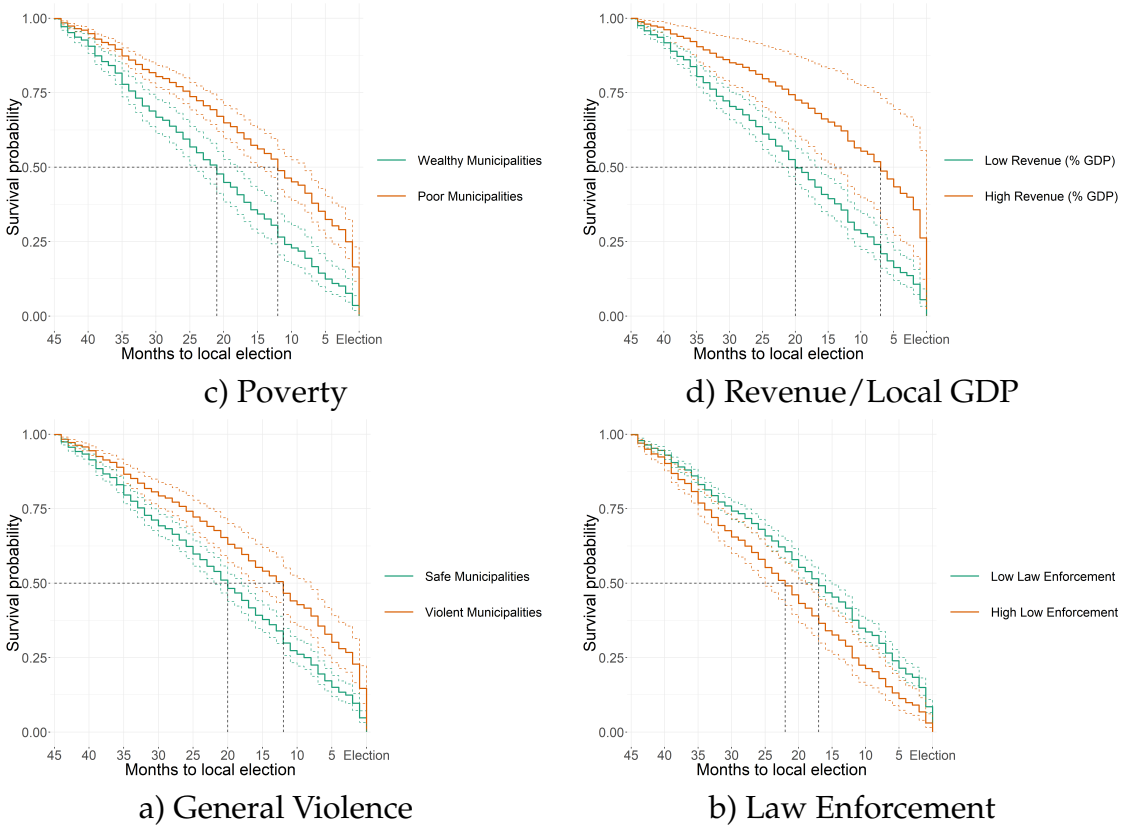
we move to the analysis toward our hypotheses exploring the impact of the explanatory variables on the intensity of the electoral cycle. Most of the coefficients go in the directions we expected. Starting with the proxies for the benefits of using violence, we find negative coefficients for the levels of poverty and municipalities with a high share of the GDP coming from the Local Executive revenues. More precisely, one standard deviation on poverty levels in the cities moves the violence thirteen percentage points closer to the election, the same variation on the level of local revenue per capita also produces an eleven percentage point movement on the proximity of the assassination to the election. Rural population and GDP per capita have no statistically significant effect.

For our third hypotheses, the coefficients extracted from the survival models go in the expected direction. The direction of the coefficients is what we expected for the presence of municipal police and the existence of judicial post in the city, although the latter only achieves statistical significance at 90% of confidence intervals. Municipalities with their own police organization push cases of violence away from the electoral period, while more violent cities increase the risk of the electoral cycles. Figure 6 plots a set of survival curves to examine some of the coefficients graphically [7]. The figures present a fascinating visualization of how some covariates push the violence closer to

[7]We use min-max variation for the continuous variables and presence of judicial post and municipal police vis-a-vis municipalities without both for the survival curve on the Law Enforcement plot

the electoral period.

Figure 6: Survival Curves for the local electoral cycles



c) Poverty

d) Revenue/Local GDP

a) General Violence

b) Law Enforcement

The separation between the curves expresses the effect of each variable on the electoral cycle of violence. Let us consider for an instant the variation due to levels of poverty and the share of revenue by the municipal GDP. It is intuitive to observe how the episodes of violence on wealthy and low revenue municipalities - the green curve - are uniform during the entire electoral cycle. However, in the other group of poor municipalities and high revenue/GDP - the red curve - the curve is pulled up which indicates a concentration of violence on the last months of the electoral cycle. The same logic applies to the other two figures. We should note that results here do not speak with the amount of violence in each case, but only explain which factors make the electoral cycles of violence more prominent.

7 Robustness Checks

In this section, we present several robustness tests to provide additional evidence in favor of our main findings and our methods.

7.1 Modeling heterogeneous effects across states and regions

The Cox survival models presented here assume that factors affecting the hazard of event occurrence are all included on the list of independent variables included on the parametric component of the estimation. However, like all statistical models, event-history models also suffer from possible omitted variables, resulting in biased estimators for the changes in the hazard rate. Even considering the spatial concentration discussed on figure 2 for the cases of political homicides, it is reasonable to assume that some states or geographical regions in Brazil have some heterogeneity across their hazard rate not included in the modeling strategy.

One conventional approach for accounting for such unobserved heterogeneity is the inclusion of random effects, or frailty terms in the survival models (**?**, Chapter 9). The frailty terms account for the fact that some units are at higher risk of experiencing the event of interest, that is, are more frail, due to factors not incorporated in the model. Therefore, the frailty models account the possibility of some units exhibit a higher propensity to experience the event of interest — and avoid biased parameter estimates.

The model consists primarily on adding a multiplicative random intercept on the baseline hazard allowing the parameter to vary randomly according to each unit. We estimate the models assuming shared frailty across i) the states, ii) the geographical regions, and iii) each local electoral cycle. To model the frailty terms, we use a hierarchical random effects model. We use the R package *coxme* to estimate the models [8] Testing for unobserved heterogeneity then involves estimating the variance term, θ, of the random effects, where small values of θ indicate the absence of heterogeneity

[8] In *coxme*. The frailties are estimated using penalized likelihoods for ease of computation, assumed to have a Gaussian distribution with mean zero, and variance equal to the sum of the parameters θ. See Therneau et al. (**?**) for more details.

across the frailty groups.

Using here these models as robustness checks, we expect to find that our estimation captures reasonably well the effects of the electoral cycle, conditional on our covariates, in the hazard rate of political crimes. Thus, we expect θ to be reasonably small. The results using shared frailty by states, geographical regions, and electoral cycles confirm our expectation. Appendix 8 presents the results for the Frailty models. The fixed coefficients are stable across the specifications, and the values for the variance θ is considerable small across the three specifications, all smaller than 0.05. In conclusion, our baseline specification covers most of the heterogeneity across our cases.

8 Conclusion

To what extent democratic elections are not a peaceful, efficient, and less costly way to define who takes what, when and how? The literature on electoral violence has a pessimist conclusion that elections exacerbate violence and human rights violations. Our study, instead, offers an alternative explanation: it is not elections per se, but specific factors that make the use of violence more likely. In this paper, we investigate under which conditions electoral cycles are more prone to trigger the use of violence. In particular focusing on episodes of targeted assassinations in Brazil, we extend our knowledge about the factors that make violence a more attractive strategy for politicians competing on democratic elections.

We organize our argument using a straightforward logic. Under some conditions, the assassination of a political opponent can be a cost-effective action. When benefits outweigh costs, i.e. the rewards of holding office are high and chances of being punished are low, politicians engage in violent crimes. We consider three main factors that can influence this cost-benefits analysis are the type of election, poverty, and law enforcement institutions. Relying on event-history models, we provide supporting evidence for these three predictions. First, local electoral cycles are more prone to trigger episodes of targeted violence. Second, in cities with high levels of poverty and power-

ful local executives, where the benefits of holding the office are greater, the proximity of the election aggravates cases of targeted assassinations. Third, municipalities with weak institutions of law enforcement and high levels of general violence also see more violent electoral cycles.

Several implications follow from the evidence we provide. First, the burgeoning literature on political violence in democratic regimes tends to consider one specific type of election violence, towards voters. Instead, we consider Staniland (2014)'s argument that electoral violence encompasses many forms of violence and we focus on targeted violence against political actors. Second, usually these studies focus on contexts where ethnicity is a source of electoral violence or states are so weak, that they cannot avoid political disorder. Despite having one of the highest homicides rates in the world, Brazil is under-investigated by this scholarship. Understanding the political dynamics of violence is thus extremely relevant for democracies ravaged by criminal conflict, land conflict, and elite control over the state apparatus. Finally, if we have a better comprehension of which factors trigger electoral violence, specific policies can be implemented to suppress the use of violence as an electoral strategy.

Our biggest challenge is how to identify the mechanisms driving violence. Although we provide consistent descriptive statistics and statistical analysis, we still miss a sharp identification strategy for targeted violence. To find some source of exogenous variation capable of explaining the episodes of violence discussed is the main challenge for future research on this topic. Using survival models, we are able to identify some of the features responsible for moving the use of violence closer to the electoral cycle.

Additionally, our paper opens some important venue for new research on the field. How do the episodes of political assassination change the electoral outcomes? It is still not clear the consequences of the use of violence in the local level. Are the assassination a signaling process of traditional elites to threat some of their opponents, or are the perpetrators of violence really targeting electorally viable opponents? These are also some of the future puzzles we expect to address on electoral killing cycles in

democratic regimes.

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Appendix A. Regression Outputs for the Models

Table 3: Results Cox Proportional Models

	Local Election	National Election
Rural population (%)	0.188	−0.301*
	(0.169)	(0.177)
Population below one minimum wage (%)	−1.234***	0.154
	(0.330)	(0.339)
Total Targeted Assassinations	0.032	0.027
	(0.020)	(0.023)
GDP Per Capita	−0.005	0.003
	(0.003)	(0.003)
Judicial Post	0.108	−0.046
	(0.109)	(0.111)
Municipal Police	0.241***	−0.013
	(0.074)	(0.073)
Regular Assassination (ln)	−0.098***	0.017
	(0.031)	(0.028)
Revenue (% GDP)	−1.008**	1.089**
	(0.457)	(0.433)
N	1,080	1,080
R^2	0.037	0.009
Max. Possible R^2	1.000	1.000
Log Likelihood	-6,447.624	-6,462.908
Wald Test (df = 8)	40.920***	10.300
LR Test (df = 8)	40.562***	9.995
Score (Logrank) Test (df = 8)	41.042***	10.291

*p < .1; **p < .05; ***p < .01

Appendix B. The results for the Frailty Model

In this appendix, we present the results for the robustness check for the presence of heterogeneous factors clustered by states, regions and electoral cycles. The results are plotted in the table below, where the first column presents the baseline Cox model without shared frailty.

Table 4: REGRESSION DISCONTINUITY RESULTS ACROSS THE SUBSAMPLES

	OUTCOME: LOCAL ELECTORAL CYCLE IN MONTHS			
	Model 1 (Normal Cox)	Model 2 (Frailty Shared by States)	Model 3 (Frailty Shared by Region)	Model 4 (Frailty Shared by Electoral Cycle)
Rural Population (%)	0.188 (0.169)	0.018 (0.181)	0.049 (0.178)	0.192 (0.169)
Minimum wage (%)	-1.234 (0.33)	-1.578 (0.379)	-1.656 (0.367)	-1.226 (0.357)
Total Political Homicides	0.032 (0.02)	0.027 (0.021)	0.033 (0.02)	0.034 (0.021)
Gdp Per Capita	-0.005 (0.003)	-0.003 (0.003)	-0.003 (0.003)	-0.005 (0.003)
Judicial Post	0.108 (0.109)	0.172 (0.113)	0.138 (0.11)	0.107 (0.109)
Municipal Police	0.241 (0.074)	0.215 (0.08)	0.229 (0.076)	0.237 (0.074)
Violent Crimes (Log)	-0.098 (0.031)	-0.121 (0.032)	-0.117 (0.031)	-0.097 (0.031)
Revenue Per Capita	-1.008 (0.457)	-0.945 (0.478)	-0.993 (0.462)	-1.034 (0.459)
Theta		0.043	0.024	0.002